

Second Quarter 2005 Groundwater Monitoring Report

Former Fir Haven Shell

Miranda, California

Case No. 12748

Prepared for:

Mr. Eugene Sky



Consulting Engineers & Geologists, Inc.

812 W. Wabash Avenue

Eureka, CA 95501-2138

707/441-8855

May 2005

001032



CONSULTING ENGINEERS & GEOLOGISTS, INC.

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Reference: 001032

June 3, 2005

Mr. Mark Verhey
Humboldt County Division of Environmental Health
100 H Street, Suite 100
Eureka, CA 95501

**Subject: Groundwater Monitoring Report, Second Quarter 2005, Former Fir Haven
Shell, Miranda, California; Case No. 12748**

Dear Mr. Verhey:

This report presents the results of the groundwater monitoring for the second quarter 2005 at the Fir Haven Shell site.

If you have any questions, please call me at 707/441-8855.

Sincerely,

SHN Consulting Engineers & Geologists, Inc.

A handwritten signature in black ink, appearing to read 'F B Lowman', written over the printed name.

Frans B. Lowman, R.G.
Project Manager

SLD:ap:lms

Enclosure: Report

copy w/encl: Mr. Eugene Sky

**Second Quarter 2005
Groundwater Monitoring Report
Former Fir Haven Shell
Miranda, California
Case No. 12748**

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Prepared by:



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QA/QC:FBL



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Acronyms and Abbreviations

<	denotes a value that is “less than” the method detection limit
ft/ft	feet per foot
mV	millivolts
ppm	parts per million
ug/g	micrograms per gram
ug/L	micrograms per Liter

BGS	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, and total Xylenes
DCO ₂	Dissolved Carbon Dioxide
DIPE	Diisopropyl Ether
DO	Dissolved Oxygen
EC	Electrical Conductivity
EPA	U.S. Environmental Protection Agency
ETBE	Ethyl Tertiary-Butyl Ether
HCDEH	Humboldt County Division of Environmental Health
MTBE	Methyl Tertiary-Butyl Ether
MW-#	Monitoring Well-#
NA	Not Analyzed
NAVD	North American Vertical Datum
NCL	North Coast Laboratories, Ltd
ND	Not Detected
NR	No Reference
NS	Not Sampled
ORP	Oxidation-Reduction Potential
QA/QC	Quality Assurance/Quality Control
SHN	SHN Consulting Engineers & Geologists, Inc.
SP-#	Soil Sample-#
TAME	Tertiary-Amyl Methyl Ether
TBA	Tertiary-Butyl Alcohol
TPHD	Total Petroleum Hydrocarbons as Diesel
TPHG	Total Petroleum Hydrocarbons as Gasoline
UST	Underground Storage Tank
WP-#	Well Point-#

1.0 Introduction

This report presents the results of groundwater monitoring activities for the second quarter 2005, conducted at the former Fir Haven Shell (Case No. 12748). The site is located at 5251 Highway 254 in the community of Miranda, California (Figure 1). SHN Consulting Engineers & Geologists, Inc. (SHN) conducted the groundwater monitoring event on May 11, 2005, as requested by the Humboldt County Division of Environmental Health (HCDEH). A site plan of the subject property is included as Figure 2.

1.1 Organization of the Report

This report is presented in five sections. This section introduces the reader to the site. Section 2.0 discusses the scope of work completed at the site during the second quarter 2005, monitoring event. Section 3.0 presents the results of the groundwater-monitoring program. Section 4.0 presents conclusions regarding the nature of the site, as well as recommendations for future activities. Section 5.0 presents a list of references cited.

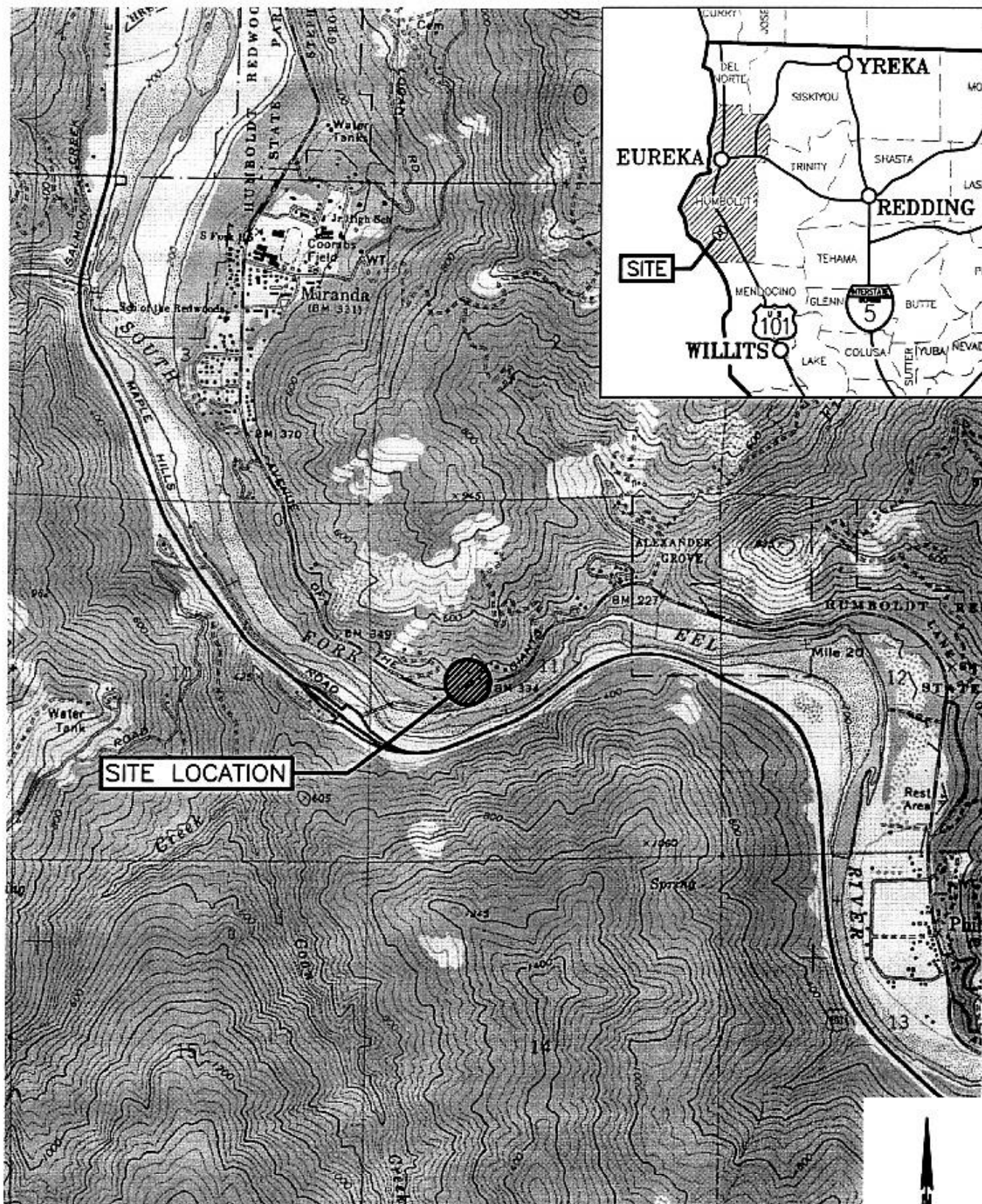
1.2 Background

The subject site is the location of a former Shell service station. On March 29, 2001, North Coast Environmental Construction abandoned two Underground Storage Tanks (USTs) previously used to store gasoline. Both USTs were abandoned in place because removal of either UST may have compromised the integrity of an existing building. Both USTs were abandoned under permit from the HCDEH, by cleaning, then tremie filling each UST with a grout mixture. Representatives from the HCDEH were present during the UST abandonment. The locations of the former tanks are shown on Figure 2.

During the UST abandonments, two soil samples were collected by SHN from beneath the location of each tank (soil samples SP-1, SP-2, SP-3, and SP-4) by cutting holes through the bottom of the tanks to access the soil beneath. All four of the soil samples were analyzed for Total Petroleum Hydrocarbons as Gasoline (TPHG); Benzene, Toluene, Ethylbenzene, and total Xylenes (BTEX); and Methyl Tertiary-Butyl Ether (MTBE). Additionally, soil sample SP-1 was analyzed for total lead, and the fuel oxygenates Diisopropyl Ether (DIPE), Ethyl Tertiary-Butyl Ether (ETBE), Tertiary-Amyl Methyl Ether (TAME), Tertiary-Butyl Alcohol (TBA), Methanol, and Ethanol.

TPHG was detected in all of the soil samples, at concentrations ranging from 760 micrograms per gram (ug/g), to 8,700 ug/g. Various components of BTEX were also present in each soil sample, including benzene at concentrations ranging from 0.77 ug/g to 5.4 ug/g. None of the fuel oxygenates, including MTBE, were detected in any of the soil samples submitted for analyses. Total lead was detected in soil sample SP-1 at a concentration of 41 ug/g. The historic soil analytical results are presented in Appendix A, Table A-1.

On November 24, 2003, SHN supervised the drilling of seven exploratory soil borings (WP-1 through WP-7) at the Fir Haven Shell site. The soil borings were drilled using a truck-mounted Geoprobe[®] rig operated by Fisch Environmental of Valley Springs, California. The



SOURCE: MIRANDA
USGS 7.5 MINUTE
QUADRANGLE

1"=2000'±

SHN
Consulting Engineers
& Geologists, Inc.

Former Fir Haven Shell
Miranda, California

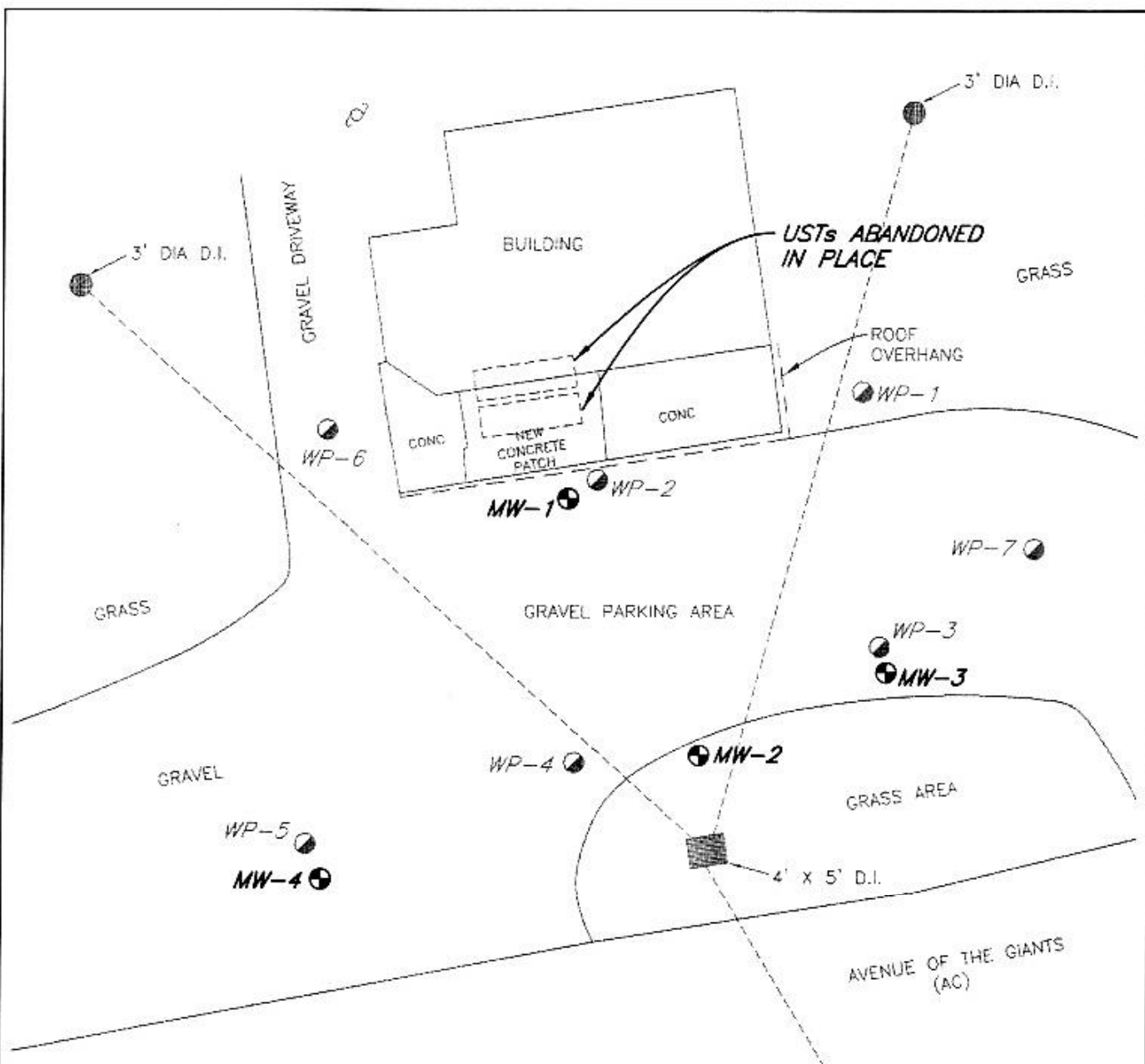
Site Location Map

SHN 001032

MAY 2005

001032-LOCATION

Figure 1



EXPLANATION

● BORING LOCATION AND DESIGNATION
WP-1 (SHN, NOVEMBER 2003)

⊕ MONITORING WELL LOCATION AND
MW-1 DESIGNATION (SHN, NOVEMBER 2004)

NOTE: BORING LOCATIONS ARE APPROXIMATE

1"=20'

SHN

Consulting Engineers
& Geologists, Inc.

Former Fir Haven Shell
Miranda, California

Site Plan

SHN 001032

DECEMBER 2004

001032-SIJ-DEC-04

Figure 2

soil borings were extended to a maximum depth of 28 feet Below Ground Surface (BGS). The exploratory soil boring locations are shown on Figure 2. Soil samples were collected from each of the exploratory borings at various depths. Groundwater samples were also collected from two of the seven borings. Groundwater was not encountered in the remaining five borings. TPHG, BTEX constituents, and lead were detected in the soil samples, and TPHG and BTEX constituents were detected in groundwater samples (Appendix A, Tables A-1 and A-2).

In July 2004, SHN submitted a work plan and associated site safety plan for further investigative work, which was approved by the HCDEH on July 29, 2004.

On November 12 and 13, 2004, SHN supervised Mitchell Drilling of Eureka, California, in the installation of four additional exploratory soil borings (MW-1, MW-2, MW-3, and MW-4). The soil borings were extended to maximum depths ranging from 30 to 50 feet BGS. Due to a lack of water in borings MW-3 and MW-4, boring MW-2 was drilled to 50 feet BGS in order to assess the presence of groundwater and the depth to bedrock. The exploratory soil boring locations are shown on Figure 2. Soil samples collected from boring location MW-1 contained detectable concentrations of TPHG and BTEX components. BTEX components were also detected in the two soil samples collected from boring MW-4. The historic soil sample analytical data from the November 2004 site investigation are presented in Appendix A, Table A-1.

The four exploratory soil borings were subsequently converted into groundwater monitoring wells. On November 22, 2004, three of the existing groundwater monitoring wells were developed and sampled. Monitoring well MW-3 was dry at the time of the fieldwork, and as such, could not be developed or sampled. Wells MW-1, MW-2, and MW-4 were developed using surge and purge techniques. The groundwater samples collected from monitoring well MW-1 contained elevated concentrations of TPHG and BTEX. No detectable concentrations of any of these constituents were present in the groundwater samples collected from wells MW-2 or MW-4.

Groundwater beneath the Former Fir Haven Shell site is monitored on a quarterly basis, as requested by the HCDEH.

2.0 Field Activities

2.1 Monitoring Well Sampling

SHN completed the groundwater-monitoring event on May 11, 2005. As part of the monitoring program, monitoring wells MW-1 through MW-4 were purged and sampled. Prior to purging, each monitoring well was measured for depth to water and checked for the presence of floating product (none was observed). Electrical Conductivity (EC), pH, and temperature were monitored periodically during purging activities using portable instrumentation. All monitoring wells were also measured for Dissolved Oxygen (DO), Oxidation-Reduction Potential (ORP), and Dissolved Carbon Dioxide (DCO₂).

A groundwater sample was then collected from each monitoring well utilizing a disposable polyethylene bailer. The water samples were immediately placed in an ice-filled cooler, and submitted to the laboratory for analyses under appropriate chain-of-custody. Field notes and water

sampling data sheets from the second quarter 2005 groundwater-monitoring event are included in Appendix B.

2.2 Laboratory Analysis

Each groundwater sample was analyzed for the following:

- TPHG, in general accordance with U.S. Environmental Protection Agency (EPA) Method Nos. 5030/GCFID/8015B.
- BTEX and MTBE, in general accordance with EPA Method Nos. 5030/8021B.

North Coast Laboratories, Ltd (NCL), a State-certified analytical laboratory located in Arcata, California, conducted all analyses.

2.3 Equipment Decontamination Procedures

All monitoring and sampling equipment was cleaned prior to being transported to the former Fir Haven Shell site. All smaller equipment was initially washed in a water solution containing Liquinox® cleaner, followed by a distilled water rinse, then by a second distilled water rinse.

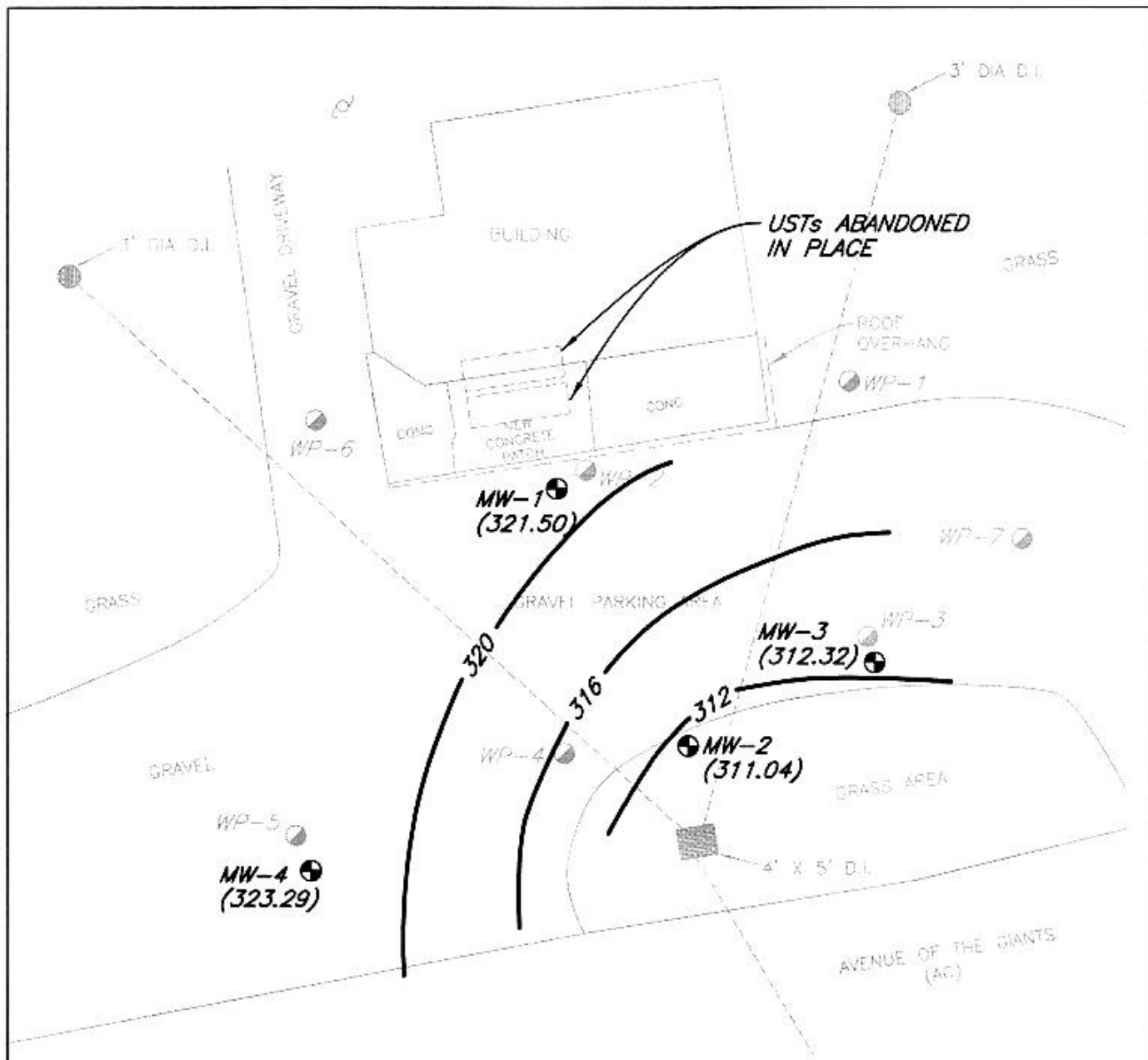
2.4 Investigation-Derived Waste Management

All rinse water utilized for decontaminating field-sampling equipment and the well purge water was temporarily stored on site in 5-gallon buckets. The water was then transported to SHN's 1,000-gallon purge water storage tank located at 812 West Wabash Avenue in Eureka, California. Approximately 36 gallons of decontamination and purge water from the May 11, 2005 groundwater-monitoring event are being stored at SHN, and will be discharged, under permit, to the City of Eureka municipal sewer system. A discharge receipt will be included in the next quarterly groundwater monitoring report. Appendix B in this report contains discharge receipts for the 67 gallons of decontamination and purge water generated during the first and second quarter 2005 sampling events.

3.0 Groundwater Monitoring Results

3.1 Hydrogeology

SHN measured depth-to-groundwater in the existing groundwater monitoring wells on May 11, 2005. During this monitoring event, the direction of groundwater flow beneath the site was to the southeast, with an estimated gradient of 0.30. A groundwater contour map for the May 11, 2005, monitoring event is presented as Figure 3. Historic groundwater elevation data are presented in Appendix A, Table A-3.



EXPLANATION

- SOIL BORING LOCATION AND DESIGNATION
WP-1 (SHN, NOVEMBER 2003)
- ⊙ MONITORING WELL LOCATION AND DESIGNATION (SHN, NOVEMBER 2004)
MW-1 (321.50) GROUNDWATER ELEVATION IN FEET (NAVD88)
- 312— GROUNDWATER CONTOUR IN FEET (NAVD88)



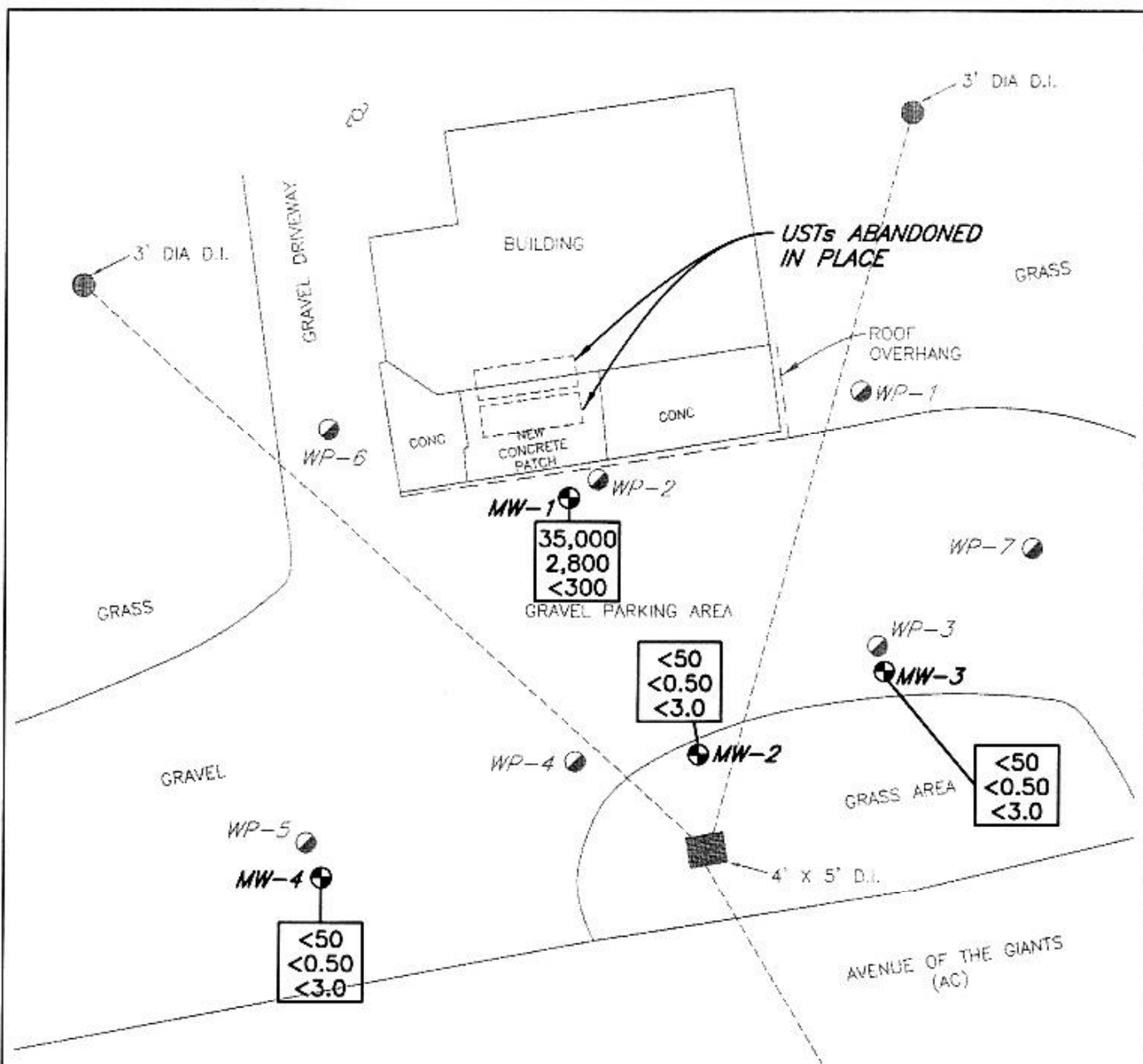
<p align="center">Table 1 Groundwater Elevations, May 11, 2005 Former Fir Haven Shell, Miranda, California</p>			
Sample Location	Top of Casing Elevation (feet)¹	Depth to Water² (feet)	Groundwater Elevation (feet)
MW-1	339.23	17.73	321.50
MW-2	338.77	27.73	311.04
MW-3	339.02	26.70	312.32
MW-4	340.11	16.82	323.29
<p>1. Referenced to North American Vertical Datum (NAVD) 88 2. Below top of casing</p>			

3.2 Groundwater Analytical Results

The laboratory analytical results for the groundwater samples collected during the second quarter 2005 monitoring event are summarized in Table 2. TPHG was detected in the groundwater sample collected from well MW-1, at a concentration of 35,000 micrograms per Liter (ug/L). Detectable concentrations of BTEX components were also present in this sample. The groundwater samples collected from wells MW-2, MW-3, and MW-4 did not contain any detectable concentrations of either TPHG or BTEX. MTBE was not detected in any of the groundwater samples collected during the second quarter 2005 monitoring event.

The concentrations of TPHG, benzene, and MTBE in groundwater on May 11, 2005 are shown on Figure 4. The complete laboratory test results, Quality Assurance/Quality Control (QA/QC) data, and chain-of-custody documentation are included in Appendix C. Historic groundwater monitoring data are presented in Appendix A, Table A-4.

<p align="center">Table 2 Groundwater Analytical Results, May 11, 2005 Former Fir Haven Shell, Miranda, California (in ug/L)¹</p>						
Sample Location	TPHG²	Benzene³	Toluene³	Ethylbenzene³	Total Xylenes³	MTBE³
MW-1	35,000 ⁴	2,800	4,000	980	5,200	<300 ^{5,6}
MW-2	<50	<0.50	<0.50	<0.50	<0.50	<3.0
MW-3	<50	<0.50	<0.50	<0.50	<0.50	<3.0
MW-4	<50	<0.50	<0.50	<0.50	<0.50	<3.0
<p>1. ug/L: micrograms per Liter 2. Total Petroleum Hydrocarbons as Gasoline (TPHG), analyzed in general accordance with EPA Method Nos. 5030/GCFID/8015B 3. Benzene, Toluene, Ethylbenzene, total Xylenes, and Methyl Tertiary-Butyl Ether (MTBE), analyzed in general accordance with EPA Method Nos. 5030/8021B 4. Sample appears to be similar to gasoline but certain peak ratios are not that of a fresh gasoline standard. The reported result represents the amount of material in the gasoline range. 5. <: Denotes a value that is "less than" the laboratory method detection limit. 6. Reporting limit was raised due to matrix interference.</p>						



EXPLANATION

● WP-1 SOIL BORING LOCATION AND DESIGNATION (SHN, NOVEMBER 2003)

● MW-1 MONITORING WELL LOCATION AND DESIGNATION (SHN, NOVEMBER 2004)

<50
 <0.50
 <3.0

TPHG
BENZENE
MTBE

RESULTS IN ug/L



SHN
Consulting Engineers
& Geologists, Inc.

Former Fir Haven Shell
Miranda, California

Petroleum Hydrocarbon Concentrations
in Groundwater, May 11, 2005
SHN 001032

MAY 2005

001032-PHC-MAY-05

Figure 4

3.3 Natural Attenuation Monitoring

Natural attenuation parameters DO, DCO₂, and ORP were measured in all four groundwater-monitoring wells on May 11, 2005, prior to sampling, and are summarized in Table 3. DO concentrations ranged from 0.05 parts per million (ppm) in wells MW-1 and MW-4 to 4.00 ppm in well MW-2. The DO concentrations in wells MW-2 and MW-3 appear to be sufficient to support biodegradation. DCO₂ concentrations ranged from 30 ppm in well MW-2 to 150 ppm in well MW-1, and indicate that biodegradation may be occurring at the site. ORP measurements ranged from -90 millivolts (mV) in well MW-1 to 208 mV in well MW-2, and indicate that oxidizing conditions exist in site groundwater away from the source area and reducing conditions exist in the source area. Historic DO, DCO₂, and ORP measurements are presented in Appendix A, Table A-5.

Table 3 DO, DCO ₂ , and ORP Measurement Results, May 11, 2005 Former Fir Haven Shell, Miranda, California			
Sample Location	DO ¹ (ppm) ²	DCO ₂ ³ (ppm)	ORP ⁴ (mV) ⁵
MW-1	0.05	150	-90
MW-2	4.00	30	208
MW-3	1.83	60	145
MW-4	0.05	40	175
<p>1. DO: Dissolved Oxygen, field measured using portable instrumentation 2. ppm: parts per million 3. DCO₂: Dissolved Carbon Dioxide, field measured using a field test kit 4. ORP: Oxidation-Reduction Potential; filed measurement using portable instrumentation 5. mV: millivolts</p>			

4.0 Discussion and Recommendations

During the second quarter 2005 groundwater-monitoring event, the groundwater sample collected from monitoring well MW-1 contained elevated concentrations of TPHG and BTEX components. None of the groundwater samples collected from wells MW-2, MW-3, or MW-4 contained detectable concentrations of either TPHG or BTEX. MTBE was not detected in any of the groundwater samples that were collected during this monitoring event.

Based on the results of this and previous groundwater monitoring events, SHN recommends that quarterly groundwater monitoring be continued at the Former Fir Haven Shell site for one additional quarter, after which time recommendations for future site activities will be presented. The next monitoring event is scheduled for August 2005. As part of the groundwater-monitoring program, each well will be analyzed for TPHG, BTEX, and MTBE. In addition, all four wells will be monitored for the natural attenuation parameters DO, DCO₂, and ORP. A quarterly groundwater monitoring report will be prepared for submittal to the HCDEH within 60 days of the sampling event.

5.0 References Cited

- SHN Consulting Engineers & Geologists, Inc. (June 19, 2001). "Site Investigation Work Plan, Former Fir Haven Shell, 5251 Highway 254, Miranda, California, HCDEH LOP No. 12748." Eureka: SHN.
- . (June 19, 2001). "Monitoring Well Installation Work Plan, Former Fir Haven Shell, Miranda, California; Case No. 12748." Eureka: SHN.
- (January 2004). *Well point Investigation Report of Findings, Former Fir Haven Shell, Miranda, California; Case No. 12748.* Eureka: SHN.
- (January 2005). Groundwater Monitoring Well Installation Report of Findings, Former Fir Haven Shell, Miranda, California; Case No. 12748. Eureka: SHN.
- U.S. Environmental Protection Agency. (December 1995). *Engineering Forum Issue, Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites.* NR:EPA.

Table A-1
Historic Soil Analytical Results
Former Fir Haven Shell, Miranda, California
(in ug/g)¹

Sample Location	Sample Date	TPHG ²	Benzene ³	Toluene ³	Ethylbenzene ³	Total Xylenes ³	m,p-Xylene ⁴	o-Xylene ⁴	MTBE ⁵	Fuel Oxygenates ⁶	Total Lead ⁷
SP-1	3/29/01	8,700	3.1	110	91	730	NA ⁸	NA	<0.20 ⁹	ND ¹⁰	NA
SP-2	3/29/01	3,000	0.77	<20 ¹¹	<3.0 ¹¹	308	NA	NA	<5.0	NA	NA
SP-3	3/29/01	2,500	5.4	67	9.4	295	NA	NA	<5.0	NA	NA
SP-4	3/29/01	760	<0.50	6.7	1.6	77	NA	NA	<5.0	NA	NA
WP-1 @ 15-16'	11/24/03	<1.0	<0.0050	<0.0050	<0.0050	NA	<0.0050	<0.0050	<0.050	NA	<10
WP-1 @ 23-24'	11/24/03	120 ¹²	<0.10 ¹¹	<0.20 ¹¹	<1.1 ¹¹	NA	<0.40 ¹¹	<1.0 ¹¹	<1.0 ¹¹	NA	<10
WP-2 @ 11-12'	11/24/03	<1.0 ¹³	<0.0050	<0.0050	<0.0050	NA	<0.010 ¹⁴	<0.0050	<0.050	NA	<10
WP-2 @ 23-24'	11/24/03	59 ¹⁵	3.2	0.92	2.5	NA	4.4	1.4	<1.0 ¹¹	NA	<10
WP-3 @ 11-12'	11/24/03	<1.0	<0.0050	<0.020 ¹¹	0.0054	NA	0.019	0.0078	<0.050	NA	<10
WP-3 @ 23-24'	11/24/03	<1.0	<0.0050	<0.0050	<0.0050	NA	<0.010 ¹³	<0.0050	<0.050	NA	<10
WP-4 @ 11-12'	11/24/03	<1.0	<0.0050	<0.0050	<0.0050	NA	<0.010 ¹³	<0.0050	<0.050	NA	12
WP-4 @ 21-22'	11/24/03	<1.0	<0.0050	<0.0050	<0.0050	NA	<0.010 ¹³	<0.0050	<0.050	NA	<10
WP-5 @ 11-12'	11/24/03	<1.0	<0.0050	<0.0050	<0.0050	NA	<0.0050	<0.0050	<0.050	NA	14
WP-5 @ 18-19'	11/24/03	1.8 ¹²	<0.0050	<0.0050	<0.018 ¹¹	NA	<0.0050	<0.0050	<0.050	NA	17
WP-6 @ 11-12'	11/24/03	<1.0	<0.0050	<0.0050	<0.0050	NA	<0.010 ¹³	<0.0050	<0.050	NA	<10
WP-6 @ 21-22'	11/24/03	<1.0	<0.0050	<0.0050	<0.0050	NA	<0.010 ¹³	<0.0050	<0.050	NA	<10
WP-7 @ 13-14'	11/24/03	<1.0	<0.0050	<0.0050	<0.0050	NA	<0.0050	<0.0050	<0.050	NA	<10
WP-7 @ 25-26'	11/24/03	<1.0	<0.0050	<0.0050	<0.0050	NA	<0.0050	<0.0050	<0.050	NA	<10
MW-1 @ 11-11.5'	11/13/04	7.0 ^{12, 15}	<0.0050	<0.050	<0.020	NA	<0.020	0.042	<0.050	NA	13
MW-1 @ 16-16.5'	11/13/04	1.0	0.0089	0.023	0.011	NA	0.022	0.012	<0.050	NA	14
MW-1 @ 21.5-23'	11/13/04	5,600 ¹⁵	20	150	71	NA	290	120	<40	NA	18
MW-2 @ 15.5-16'	11/12/04	<1.0	<0.0050	<0.0050	<0.0050	NA	<0.0050	<0.0050	<0.050	NA	15
MW-2 @ 26-26.5'	11/12/04	<1.0	<0.0050	<0.0050	<0.0050	NA	<0.0050	<0.0050	<0.050	NA	18
MW-3 @ 15.5-16'	11/12/04	<1.0	<0.0050	<0.0050	<0.0050	NA	<0.0050	<0.0050	<0.050	NA	25
MW-3 @ 25-25.5'	11/12/04	<1.0	<0.0050	<0.0050	<0.0050	NA	<0.0050	<0.0050	<0.050	NA	14
MW-4 @ 17.5-18'	11/12/04	<1.0	<0.0050	0.0077	<0.0050	NA	0.0091	<0.0050	<0.050	NA	14
MW-4 @ 23.5-24'	11/12/04	<1.0	<0.0050	0.0069	<0.0050	NA	0.0086	0.0066	<0.050	NA	10

Table A-1, Continued
Historic Soil Analytical Results
Former Fir Haven Shell, Miranda, California
(in ug/g)¹

Sample Location	Sample Date	TPHG ²	Benzene ³	Toluene ³	Ethylbenzene ³	Total Xylenes ³	m,p-Xylene ⁴	o-Xylene ⁴	MTBE ⁵	Fuel Oxygenates ⁶	Total Lead ⁷
<p>1. ug/g: micrograms per gram</p> <p>2. TPHG: Total Petroleum Hydrocarbons as Gasoline, analyzed in general accordance with EPA Method Nos. 5030 or 8260B</p> <p>3. BTEX: Benzene, Toluene, Ethylbenzene, and tota Xylenes, analyzed in general accordance with EPA Method Nos. 8020 or 8260B</p> <p>4. m,p-Xylene and o-Xylene, analyzed in general accordance with EPA Method Nos. 5035/8021B</p> <p>5. MTBE: Methyl Tertiary-Butyl Ether, analyzed in general accordance with EPA Method Nos. 8020 or 8260B</p> <p>6. Fuel Oxygenates: Diisopropyl Ether (DIPE), Ethyl TertiaryButyl Ether (ETBE), Tertiary-Amyl Methyl Ether (TAME), Tertiary-Butyl Alcohol (TBA), methanol, and ethanol, analyzed in general accordance with EPA Method No. 8260B</p> <p>7. Total lead, analyzed in general accordance with EPA Method No. 6010B</p> <p>8. NA: Not Analyzed</p> <p>9. <: Denotes a value that is "less than" the laboratory method detection limit.</p> <p>10. ND: Not Detectable; fuel oxygenates not detected above their respective method reporting limits; see laboratory reports</p> <p>11. Method reporting limit was raised due to matrix interference.</p> <p>12. Sample does not represent a peak pattern consistent with that of gasoline. The reported results represent the amount of material in the gasoline range.</p> <p>13. Sample was reported as non-detectable due to matrix interference.</p> <p>14. The reporting limit was raised due to an extracted interferant.</p> <p>15. Sample appears to be similar to gasoline but certain peak ratios are not that of a fresh gasoline standard. The reported result represents the amount of material in the gasoline range.</p>											

Table A-2
Historic Groundwater Analytical Results
Former Fir Haven Shell, Miranda, California
(in ug/L)

Sample Location	Sample Date	TPHG²	TPHD³	B⁴	T⁴	E⁴	X⁴	MTBE⁴
DW-1 ⁵	9/30/02	<50 ⁶	<50	<0.50	<0.50	<0.50	<0.50	<3.0
WP-1	11/24/03	490 ⁷	NA ⁸	5.3 ⁹	<5.0 ¹⁰	9.3	6.2	<3.0
WP-2	11/24/03	2,700,000 ¹⁰	NA	15,000	72,000	100,000	660,000	<30,000 ⁹

1. ug/L: micrograms per Liter
2. TPHG: Total Petroleum Hydrocarbons as Gasoline analyzed in general accordance with EPA Method No. 3510/GCFID./8015B
3. TPHD: Total Petroleum Hydrocarbons as Diesel analyzed in general accordance with EPA Method No. 3510/GCFID
4. Benzene (B), Toluene (T), Ethylbenzene (E), total Xylenes (X), and Methyl Tertiary-Butyl Ether (MTBE) analyzed in accordance with EPA Method No. 5030/8021B
5. Groundwater sample collected from a domestic well located on the site property. Sample collected by HCDEH personnel.
6. <: Denotes a value that is "less than" the method detection limit.
7. The gasoline value includes the reported gasoline components and additives in addition to other peaks in the gasoline range.
8. NA: Not Analyzed
9. Reporting limit was raised due to matrix interference.
10. Sample appears to be similar to gasoline but certain peak ratios are not of a fresh gasoline standard; the reported result represents the amount of material in the gasoline range.

Table A-3 Historic Groundwater Elevations Former Fir Haven Shell, Miranda, California				
Sample Location	Sample Date	Top of Casing Elevation (feet) ¹	Depth to Water ² (feet)	Groundwater Elevation (feet)
MW-1	11/20/04	339.23	19.95	319.28
	1/21/05		18.13	321.10
	5/11/05		17.73	321.50
MW-2	11/20/04	338.77	32.78	305.99
	1/21/05		29.55	309.22
	5/11/05		27.73	311.04
MW-3	11/20/04	339.02	DRY ³	--
	1/21/05		27.44	311.58
	5/11/05		26.70	312.32
MW-4	11/20/04	340.11	22.68	317.43
	1/21/05		18.09	322.02
	5/11/05		16.82	323.29
1. Referenced to North American Vertical Datum (NAVD) 88 2. Below top of casing 3. Well was dry on November 20, 2004. As such, a depth to water measurement could not be collected.				

Table A-4
Historic Groundwater Monitoring Well Analytical Results
Former Fir Haven Shell, Miranda, California
(in ug/L)¹

Sample Location	Sample Date	TPHG ²	B ³	T ³	E ³	X ³	MTBE ³
MW-1	11/20/04	53,000 ⁴	4,300	5,900	1,600	8,600	<600 ^{5,6}
	1/21/05	26,000	3,200	2,500	870	3,900	<300 ⁶
	5/11/05	35,000 ⁴	2,800	4,000	980	5,200	<300 ⁶
MW-2	11/20/04	<50	<0.50	<0.50	<0.50	<0.50	<3.0
	1/21/05	<50	<0.50	<0.50	<0.50	<0.50	<3.0
	5/11/05	<50	<0.50	<0.50	<0.50	<0.50	<3.0
MW-3	11/20/04	NS ⁷	NS	NS	NS	NS	NS
	1/21/05	<50	<0.50	<0.50	<0.50	<0.50	<3.0
	5/11/05	<50	<0.50	<0.50	<0.50	<0.50	<3.0
MW-4	11/20/04	<50	<0.50	<0.50	<0.50	<0.50	<3.0
	1/21/05	<50	<0.50	<0.50	<0.50	<0.50	<3.0
	5/11/05	<50	<0.50	<0.50	<0.50	<0.50	<3.0

1. ug/L: micrograms per Liter
2. TPHG: Total Petroleum Hydrocarbons as Gasoline, analyzed in general accordance with EPA Method Nos. 3510/GCFID./8015B or 5030/GCFID/8015B
3. Benzene (B), Toluene (T), Ethylbenzene (E), m,p-Xylene, o-Xylene, and Methyl Tertiary-Butyl Ether (MTBE), analyzed in general accordance with EPA Method Nos. 5030/8021B
4. Sample appears to be similar to gasoline but certain peak ratios are not that of a fresh gasoline standard. The reported result represents the amount of material in the gasoline range.
5. <: Denotes a value that is "less than" the method detection limit.
6. Reporting limit raised due to matrix interference.
7. NS: Not Sampled

Table A-5
Historic DO, DCO₂, and ORP Measurement Results
Former Fir Haven Shell, Miranda, California

Sample Location	Sample Date	DO ¹ (ppm) ²	DCO ₂ ³ (ppm)	ORP ⁴ (mV) ⁵
MW-1	1/21/05	2.09	180	-67
	5/11/05	0.05	150	-90
MW-2	1/21/05	4.96	30	93
	5/11/05	4.00	30	208
MW-3	1/21/05	5.26	60	116
	5/11/05	1.83	60	145
MW-4	1/21/05	2.04	40	104
	5/11/05	0.05	40	175

1. DO: Dissolved Oxygen, field measured using portable instrumentation
2. ppm: parts per million
3. DCO₂: Dissolved Carbon Dioxide, field measured using a field test kit
4. ORP: Oxidation-Reduction Potential; field measurement using portable instrumentation
5. mV: millivolts



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DAILY FIELD REPORT

JOB NO 001032

Page 1 of 8

PROJECT NAME Former Firehaven Shell	CLIENT/OWNER Eugene SKY	DAILY FIELD REPORT SEQUENCE NO 1	
GENERAL LOCATION OF WORK Miranda, CA	OWNER/CLIENT REPRESENTATIVE	DATE 5-11-05	DAY OF WEEK Wednesday
TYPE OF WORK Quarterly sampling	WEATHER Partially clear to clear	PROJECT ENGINEER/ SUPERVISOR Frans Lowman	
SOURCE & DESCRIPTION OF FILL MATERIAL	KEY PERSONS CONTACTED	TECHNICIAN David R. Paine	

DESCRIBE EQUIPMENT USED FOR HAULING, SPREADING, WATERING, CONDITIONING, & COMPACTING

0930 Arrived at site, removed lids and caps on all 4 wells, MW-2 and MW-3 had water in flush mount, bailed out.

1001 I started taking water levels decoring the sounder after each well by scrubbing it with liquorin then rinsing it with DI water.

1024 I started taking DO readings.

1046 I started purging MW-3 with a disposable bailer, purge water was caught in a graduated 1 gal. bucket, well went dry.

1110 I started purging MW-4 with a disposable bailer, purge water was caught in a graduated 5 gal. bucket.

1140 I started purging MW-2 with a disposable bailer, purge water was caught in a graduated 5 gal. bucket.

1255 I sampled MW-4, secured well with cap and lid.

1259 I started purging MW-1 with a disposable bailer, purge water was caught in a graduated 5 gal. bucket.

1330 I sampled MW-2, secured well with cap and lid.

1345 I sampled MW-3, secured well with cap and lid.

1400 I sampled MW-1, secured well with cap and lid.

1417 OFF SITE

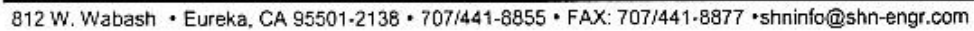
Note: All decorn water and purge water was caught in 5 gal. buckets with lids then transported to SHN's 1,000 gal. PWSST located at 812 W. Wabash Avenue Eureka, CA 36 gallons total.

Michael wants the soil drum to disappear.

COPY SENT TO:

REPORTED BY:

David R. Paine



Weather: Partially clear



EQUIPMENT CALIBRATION SHEET

Name: David R. Paine

Project Name: Former Fire Haven Shell

Reference No.: 001032

Date: 5-11-05

Equipment: ☒ pH & EC ☐ PID ☐ GTCO₂ ☐ GTLEL

☐ Turbidity ☒ Other Dissolved Oxygen Meter YSI95

Description of Calibration Procedure and Results:

pH & EC meter is calibrated using a 2 buffer
method with 7.01 and 4.01, the EC (conductivity) is
set at 1413 μ S.

DO meter is self calibrating with the
Altimeter set at 3.



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Water Sampling Data Sheet

Project Name: <u>Former Fir Haven Shell</u>	Date/Time: <u>5-11-05</u>
Project No.: <u>001032</u>	Sampler Name: <u>David R. Paine</u>
Location: <u>Miranda, CA</u>	Sample Type: <u>Ground water</u>
Well #: <u>MW-4</u>	Weather: <u>Partially clear to clear</u>
Hydrocarbon Thickness/Depth (feet): <u>NA</u>	Key Needed: <u>yes Dolphin</u>

Total Well Depth (feet)	-	Initial Depth to Water (feet)	=	Height of Water Column (feet)	x	0.163 gal/ft (2-inch well) / 0.653 gal/ft (4-inch well)	=	1 Casing Volume (gal)
<u>29.32</u>	-	<u>16.82</u>	=	<u>12.50</u>	x	<u>0.163</u>	=	<u>2.04</u>

Time	DO (ppm)	CO ₂ (ppm)	ORP (mV)	EC (uS/cm)	Temp (°F)	pH	Water Removed (gal)	Comments
1029	<u>0.05</u>						<u>0 gal</u>	
1110		<u>40</u>	<u>175</u>				<u>0.25 gal</u>	
1119				<u>566</u>	<u>65.2°</u>	<u>7.14</u>	<u>2.25 gal</u>	
1124	<u>No Flow</u>			<u>571</u>	<u>65.2°</u>	<u>7.11</u>	<u>4.25 gal</u>	
1129	<u>then cell</u>			<u>571</u>	<u>65.4°</u>	<u>7.12</u>	<u>6.25 gal</u>	
1255	<u>Sample Time</u>							

Purge Method: Hand BailTotal Volume Removed: 6.25 (gal)

Laboratory Information

Sample ID	# & Type of Containers	Preservative / Type	Laboratory	Analyses
<u>MW-4</u>	<u>3-40ml WDM's</u>	<u>YES HCL</u>	<u>NCL</u>	<u>TPH9/BTEX/MTBE</u>

Well Condition: Good

Remarks:

Recharged to 21.03 at sample time



Water Sampling Data Sheet

Project Name: <u>Former Fire Haven Shell</u>	Date/Time: <u>5-11-05</u>
Project No.: <u>001032</u>	Sampler Name: <u>David R. Paine</u>
Location: <u>Miranda, CA</u>	Sample Type: <u>Ground water</u>
Well #: <u>MW-2</u>	Weather: <u>Partially clear to clear</u>
Hydrocarbon Thickness/Depth (feet): <u>NA</u>	Key Needed: <u>yes Dolphin</u>

Total Well Depth (feet)	-	Initial Depth to Water (feet)	=	Height of Water Column (feet)	x	0.163 gal/ft (2-inch well) / 0.653 gal/ft (4-inch well)	=	1 Casing Volume (gal)
<u>50.17</u>	-	<u>27.73</u>	=	<u>22.44</u>	x	<u>0.163</u>	=	<u>3.66</u>

Time	DO (ppm)	CO ₂ (ppm)	ORP (mV)	EC (uS/cm)	Temp (°F)	pH	Water Removed (gal)	Comments
1032	4.00						0 gal.	
1140		30	208				0.25 gal.	
1154				171	64.2°	6.42	3.25 gal.	
1204	No Flow			212	63.1°	6.63	7.50 gal.	
1218	Hen cell			232	62.5°	6.69	11.25 gal.	
1228				230	62.4°	6.76	15 gal.	
1239				250	62.4°	6.81	18.75 gal.	
1330	Sample Time							

Purge Method: Hand BailTotal Volume Removed: 18.75 (gal)

Laboratory Information

Sample ID	# & Type of Containers	Preservative / Type	Laboratory	Analyses
MW-2	3-40ml VOA's	YES HCL	NCL	TPH9/BTEX/MTBE

Well Condition: Good

Remarks:

Recharged to 31.80 at sample time



Water Sampling Data Sheet

Project Name: <u>Former Fire Haven Shell</u>	Date/Time: <u>5-11-05</u>
Project No.: <u>001032</u>	Sampler Name: <u>David R. Paine</u>
Location: <u>Miranda, CA</u>	Sample Type: <u>Ground water</u>
Well #: <u>MW-3</u>	Weather: <u>Partially clear to clear</u>
Hydrocarbon Thickness/Depth (feet): <u>NA</u>	Key Needed: <u>yes Dolphin</u>

Total Well Depth (feet)	-	Initial Depth to Water (feet)	=	Height of Water Column (feet)	x	0.163 gal/ft (2-inch well) / 0.653 gal/ft (4-inch well)	=	1 Casing Volume (gal)
<u>29.35</u>	-	<u>26.70</u>	=	<u>2.65</u>	x	<u>0.163</u>	=	<u>0.43</u>

Time	DO (ppm)	CO ₂ (ppm)	ORP (mV)	EC (uS/cm)	Temp (°F)	pH	Water Removed (gal)	Comments
1025	<u>1.83</u>						<u>0 gal.</u>	
1046		<u>60</u>	<u>145</u>				<u>0.20 gal.</u>	
1053				<u>772</u>	<u>58°</u>	<u>6.75</u>	<u>0.50 gal.</u>	
1058	<u>No Flow</u>			<u>706</u>	<u>57.9°</u>	<u>6.75</u>	<u>1 gal.</u>	
1106	<u>then cell</u>			<u>677</u>	<u>58.6°</u>	<u>6.77</u>	<u>1.30 gal.</u>	<u>Dry</u>
1135				<u>687</u>	<u>59.7°</u>	<u>6.88</u>	<u>1.45 gal.</u>	<u>Dry</u>
1345	<u>sample</u>	<u>Time</u>						

Purge Method: Hand BailTotal Volume Removed: 1.50 (gal)

Laboratory Information

Sample ID	# & Type of Containers	Preservative / Type	Laboratory	Analyses
<u>MW-3</u>	<u>3-40ml vials</u>	<u>YES HCL</u>	<u>NCL</u>	<u>TPHG / BTEX / MTBE</u>

Well Condition: Good

Remarks:

Recharged to 28.00 at sample time



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Water Sampling Data Sheet

Project Name:	<u>Former Fir Haven Shell</u>	Date/Time:	<u>5-11-05</u>
Project No.:	<u>001032</u>	Sampler Name:	<u>David R. Paine</u>
Location:	<u>Miranda, CA</u>	Sample Type:	<u>Ground water</u>
Well #:	<u>MW-1</u>	Weather:	<u>Partially clear to clear</u>
Hydrocarbon Thickness/Depth (feet):	<u>NA</u>	Key Needed:	<u>yes Dolphin</u>

Total Well Depth (feet)	-	Initial Depth to Water (feet)	=	Height of Water Column (feet)	x	0.163 gal/ft (2-inch well) / 0.653 gal/ft (4-inch well)	=	1 Casing Volume (gal)
<u>30.05</u>	-	<u>17.73</u>	=	<u>12.32</u>	x	<u>0.163</u>	=	<u>2.01</u>

Time	DO (ppm)	CO ₂ (ppm)	ORP (mV)	EC (uS/cm)	Temp (°F)	pH	Water Removed (gal)	Comments
1036	<u>0.05</u>						<u>0 gal</u>	
1257		<u>150</u>	<u>-90</u>				<u>0.25 gal</u>	
1307	<u>↓</u>			<u>519</u>	<u>60.1°</u>	<u>6.64</u>	<u>2 gal</u>	
1312	<u>No Flow</u>			<u>556</u>	<u>59.5°</u>	<u>6.66</u>	<u>4 gal</u>	
1318	<u>then cell</u>			<u>545</u>	<u>59.8°</u>	<u>6.72</u>	<u>6 gal</u>	
1400	<u>Sample Time</u>							

Purge Method: Hand Bail

Total Volume Removed: 6.00 (gal)

Laboratory Information

Sample ID	# & Type of Containers	Preservative / Type	Laboratory	Analyses
<u>MW-1</u>	<u>3-40ml UDMA's</u>	<u>YES HCL</u>	<u>NCL</u>	<u>TPHG / BTEX / MTBE</u>

Well Condition: Good

Remarks:

Recharged to 18.87 at sample time

Client Name: **FORMER FIR HAVEN SHELL**

The water from your site: **5251 HIGHWAY 254 MIRANDA, CA**
 RWQCB CASE # 12748

SHN ref # **001032** Collected On: **1/21/05**

Has been tested and certified as acceptable to be discharged into the City of Eureka municipal sewer system.

Amount Discharged: **31 GALLONS**

Date Discharged: **2/28/05**

Certified by: **DAVID R. PAINE**

SHN CONSULTING ENGINEERS & GEOLOGISTS, INC.
City of Eureka Wastewater Discharge Permit #65

Client Name: **FORMER FIR HAVEN SHELL**

The water from your site: **5251 HIGHWAY 254 MIRANDA, CA
RWQCB CASE # 12748**

SHN ref # **001032** Collected On: **5/11/05**

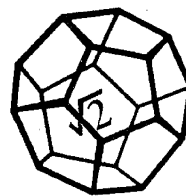
Has been tested and certified as acceptable to be discharged into the City of Eureka municipal sewer system.

Amount Discharged: **36 GALLONS**

Date Discharged: **5/23/05**

Certified by: **DAVID R. PAINE**

SHN CONSULTING ENGINEERS & GEOLOGISTS, INC.
City of Eureka Wastewater Discharge Permit #65



**NORTH COAST
LABORATORIES LTD.**

May 18, 2005

SHN Consulting Engineers and Geologists
812 West Wabash Avenue
Eureka, CA 95501

Attn: Frans Lowman

RE: 001032, Former Fir Haven Shell

Order No.: 0505241

Invoice No.: 50187

PO No.:

ELAP No. 1247-Expires July 2006

SAMPLE IDENTIFICATION

Fraction	Client Sample Description
----------	---------------------------

01A	MW-4
02A	MW-2
03A	MW-3
04A	MW-1

ND = Not Detected at the Reporting Limit

Limit = Reporting Limit

All solid results are expressed on a wet-weight basis unless otherwise noted.

REPORT CERTIFIED BY

Laboratory Supervisor(s)

QA Unit

Jesse G. Chaney, Jr.
Laboratory Director

North Coast Laboratories, Ltd.

Date: 18-May-05

CLIENT: SHN Consulting Engineers and Geologists
Project: 001032, Former Fir Haven Shell
Lab Order: 0505241

CASE NARRATIVE**TPH as Gasoline:**

Sample MW-1 appears to be similar to gasoline but certain peak ratios are not that of a fresh gasoline standard. The reported result represents the amount of material in the gasoline range.

BTEX:

Sample MW-1 was reported as ND with a dilution due to matrix interference.

Date: 18-May-05

WorkOrder: 0505241

ANALYTICAL REPORT

Client Sample ID: MW-4

Received: 5/11/05

Collected: 5/11/05 12:55

Lab ID: 0505241-01A

Test Name: BTEX

Reference: EPA 5030/EPA 8021B

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
MTBE	ND	3.0	µg/L	1.0		5/17/05
Benzene	ND	0.50	µg/L	1.0		5/17/05
Toluene	ND	0.50	µg/L	1.0		5/17/05
Ethylbenzene	ND	0.50	µg/L	1.0		5/17/05
m,p-Xylene	ND	0.50	µg/L	1.0		5/17/05
o-Xylene	ND	0.50	µg/L	1.0		5/17/05
Surrogate: Cis-1,2-Dichloroethylene	96.5	85-115	% Rec	1.0		5/17/05

Test Name: TPH as Gasoline

Reference: EPA 5030/GCFID(LUFT)/EPA 8015B

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
TPHC Gas (C6-C14)	ND	50	µg/L	1.0		5/17/05

Client Sample ID: MW-2

Received: 5/11/05

Collected: 5/11/05 13:30

Lab ID: 0505241-02A

Test Name: BTEX

Reference: EPA 5030/EPA 8021B

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
MTBE	ND	3.0	µg/L	1.0		5/17/05
Benzene	ND	0.50	µg/L	1.0		5/17/05
Toluene	ND	0.50	µg/L	1.0		5/17/05
Ethylbenzene	ND	0.50	µg/L	1.0		5/17/05
m,p-Xylene	ND	0.50	µg/L	1.0		5/17/05
o-Xylene	ND	0.50	µg/L	1.0		5/17/05
Surrogate: Cis-1,2-Dichloroethylene	95.9	85-115	% Rec	1.0		5/17/05

Test Name: TPH as Gasoline

Reference: EPA 5030/GCFID(LUFT)/EPA 8015B

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
TPHC Gas (C6-C14)	ND	50	µg/L	1.0		5/17/05

Date: 18-May-05

WorkOrder: 0505241

ANALYTICAL REPORT

Client Sample ID: MW-3

Received: 5/11/05

Collected: 5/11/05 13:45

Lab ID: 0505241-03A

Test Name: BTEX

Reference: EPA 5030/EPA 8021B

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
MTBE	ND	3.0	µg/L	1.0		5/17/05
Benzene	ND	0.50	µg/L	1.0		5/17/05
Toluene	ND	0.50	µg/L	1.0		5/17/05
Ethylbenzene	ND	0.50	µg/L	1.0		5/17/05
m,p-Xylene	ND	0.50	µg/L	1.0		5/17/05
o-Xylene	ND	0.50	µg/L	1.0		5/17/05
Surrogate: Cis-1,2-Dichloroethylene	94.1	85-115	% Rec	1.0		5/17/05

Test Name: TPH as Gasoline

Reference: EPA 5030/GCFID(LUFT)/EPA 8015B

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
TPHC Gas (C6-C14)	ND	50	µg/L	1.0		5/17/05

Client Sample ID: MW-1

Received: 5/11/05

Collected: 5/11/05 14:00

Lab ID: 0505241-04A

Test Name: BTEX

Reference: EPA 5030/EPA 8021B

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
MTBE	ND	300	µg/L	100		5/17/05
Benzene	2,800	500	µg/L	1,000		5/17/05
Toluene	4,000	500	µg/L	1,000		5/17/05
Ethylbenzene	980	500	µg/L	1,000		5/17/05
m,p-Xylene	3,700	500	µg/L	1,000		5/17/05
o-Xylene	1,500	500	µg/L	1,000		5/17/05
Surrogate: Cis-1,2-Dichloroethylene	112	85-115	% Rec	100		5/17/05

Test Name: TPH as Gasoline

Reference: EPA 5030/GCFID(LUFT)/EPA 8015B

<u>Parameter</u>	<u>Result</u>	<u>Limit</u>	<u>Units</u>	<u>DF</u>	<u>Extracted</u>	<u>Analyzed</u>
TPHC Gas (C6-C14)	35,000	5,000	µg/L	100		5/17/05

North Coast Laboratories, Ltd.

Date: 18-May-05

CLIENT: SHN Consulting Engineers and Geologists

Work Order: 0505241

Project: 001032, Former Fir Haven Shell

QC SUMMARY REPORT

Method Blank

Sample ID: MB-5/16/05	Batch ID: R34907	Test Code: BTXEW	Units: µg/L	Analysis Date: 5/16/05 10:11:08 PM	Prep Date:						
Client ID:	Run ID: ORGC8_050516B	SeqNo: 505369									
Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
MTBE	ND	3.0									
Benzene	ND	0.50									
Toluene	ND	0.50									
Ethylbenzene	ND	0.50									
m,p-Xylene	ND	0.50									
o-Xylene	ND	0.50									
Cis-1,2-Dichloroethylene	0.922	0.10	1.00	0	92.2%	85	115	0			

Sample ID: MB-5/16/05	Batch ID: R34906	Test Code: TPHCGW	Units: µg/L	Analysis Date: 5/16/05 10:11:08 PM	Prep Date:						
Client ID:	Run ID: ORGC8_050516A	SeqNo: 505348									
Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gas (C6-C14)	ND	50									

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

North Coast Laboratories, Ltd.

Date: 18-May-05

CLIENT: SHN Consulting Engineers and Geologists

Work Order: 0505241

Project: 001032, Former Fir Haven Shell

QC SUMMARY REPORT

Laboratory Control Spike

Sample ID: LCS-05325	Batch ID: R34907	Test Code: BTXEW	Units: µg/L	Analysis Date: 5/16/05 5:28:38 PM	Prep Date:						
Client ID:	Run ID: ORGC8_050516B	SeqNo: 505366									
Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
MTBE	41.45	3.0	40.0	0	104%	85	115	0			
Benzene	4.989	0.50	5.00	0	99.8%	85	115	0			
Toluene	4.945	0.50	5.00	0	98.9%	85	115	0			
Ethylbenzene	4.953	0.50	5.00	0	99.1%	85	115	0			
m,p-Xylene	9.813	0.50	10.0	0	98.1%	85	115	0			
o-Xylene	4.804	0.50	5.00	0	96.1%	85	115	0			
Cis-1,2-Dichloroethylene	1.11	0.10	1.00	0	111%	85	115	0			

Sample ID: LCS-05325		Batch ID: R34907		Test Code: BTXEW		Units: µg/L		Analysis Date: 5/16/05 6:04:24 PM		Prep Date:	
Client ID:		Run ID: ORGC8_050516B		SeqNo: 505367							
Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
MTBE	40.87	3.0	40.0	0	102%	85	115	41.4	1.43%	15	
Benzene	4.972	0.50	5.00	0	99.4%	85	115	4.99	0.334%	15	
Toluene	4.926	0.50	5.00	0	98.5%	85	115	4.94	0.394%	15	
Ethylbenzene	4.943	0.50	5.00	0	98.9%	85	115	4.95	0.190%	15	
m,p-Xylene	9.859	0.50	10.0	0	98.6%	85	115	9.81	0.464%	15	
o-Xylene	4.813	0.50	5.00	0	96.3%	85	115	4.80	0.193%	15	
Cis-1,2-Dichloroethylene	1.08	0.10	1.00	0	108%	85	115	1.11	2.56%	15	

Sample ID: LCS-05326	Batch ID: R34906	Test Code: TPHCGW	Units: µg/L	Analysis Date: 5/16/05 7:50:52 PM	Prep Date:						
Client ID:	Run ID: ORGC8_050516A	SeqNo: 505345									
Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gas (C6-C14)	497.1	50	500	0	99.4%	81	126	0			

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

CLIENT: SHN Consulting Engineers and Geologists
Work Order: 0505241
Project: 001032, Former Fir Haven Shell

QC SUMMARY REPORT
Laboratory Control Spike Duplicate

Sample ID: LCSD-05326	Batch ID: R34906	Test Code: TPHCGW	Units: µg/L	Analysis Date: 5/16/05 8:26:05 PM				Prep Date:			
Client ID:		Run ID: ORGC8_050516A		SeqNo: 505346							
Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gas (C6-C14)	505.6	50	500	0	101%	81	126	497	1.70%	15	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank



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Chain of Custody

P. 1 of 1

0505241

LABORATORY NUMBER:

TAT: ☐ 24 Hr ☐ 48 Hr ☐ 5 Day ☐ 5-7 Day

☒ STD (2-3 Wk) ☐ Other:

PRIOR AUTHORIZATION IS REQUIRED FOR RUSHES

REPORTING REQUIREMENTS: State Forms ☐

Preliminary: FAX ☐ Verbal ☐ By: / /Final Report: FAX ☐ Verbal ☐ By: / /

CONTAINER CODES: 1— $\frac{1}{2}$ gal. pl; 2—250 ml pl; 3—500 ml pl; 4—1 L Nalgene; 5—250 ml BG; 6—500 ml BG; 7—1 L BG; 8—1 L cg; 9—40 ml VOA; 10—125 ml VOA; 11—4 oz glass jar; 12—8 oz glass jar; 13—brass tube; 14—other

PRESERVATIVE CODES: a— HNO_3 ; b— HCl ; c— H_2SO_4 ; d— $\text{Na}_2\text{S}_2\text{O}_3$; e— NaOH ; f— $\text{C}_6\text{H}_5\text{O}_2\text{Cl}$; g—other

SAMPLE CONDITION/SPECIAL INSTRUCTIONS

END

Subb1 LD# T0602371110

CableTemp = 5.9°C

SAMPLE DISPOSAL

☒ NCL Disposal of Non-Contaminated☐ Return ☐ Pickup

CHAIN OF CUSTODY SEALS Y/N/NA

SHIPPED VIA: UPS Air-Ex Fed-Ex Bus Hand

***MATRIX:** DW=Drinking Water; Eff=Effluent; Inf=Influent; SW=Surface Water; GW=Ground Water; S=Soil; O=Other.

ALL CONTAMINATED NON-AQUEOUS SAMPLES WILL BE RETURNED TO CLIENT